

REMARKS

The claims are 21 to 28.

The above amendment presents a new set of claims responsive to points set forth in the Official Action.

The new claims replace claims 12 to 19, respectively.

With regard to the comment that claim 12 lacks a transitional phrase, this is no longer the case in connection with replacement claim 21.

With regard to the rejection of the term “by the line atomizing process”, this process is for injecting a microscopically or sub-microscopically fine dispersion of a gas into a liquid medium as contrasted to e.g. the tank-mixing method, in which the dispersant gas is bubbled into the dispersion medium, i.e. liquid, in a tank under vigorous agitation.

The line-atomizing process is conducted using a so-called in-line atomizer which is a kind of mixer for effecting gas-liquid dispersion but is within the liquid-flowing pipeline *per se* so that the dispersant gas is dispersed *in situ* into the liquid under flowing through the pipeline.

With regard to the rejection of the term “by the bio-solids method”, it should be noted that the “bio-solids method” is the “activated sludge process”. In this regard, see, for example, Webster’s Third New International Dictionary (copy enclosed) which defines the “activated sludge method” as: “a sewage treatment process in which the decomposition of the raw sewage is hastened by the addition of biologically active sewage sludge”. The term “bio-solids method” of the present application refers to such process.

Also see the definition set forth in the attached EPA publication which points out that biosolids are nutrient-rich organic materials resulting from the treatment of sewage sludge.

With regard to the suggested claim format, this has been adopted by the above amendment.

With regard to the issue of whether “biosolid water” or “clean water” are alternatives for the same concept or different alternatives, this is clarified in new main

claim 21 wherein it is pointed out in step a., that the alternatives are wastewater from an activated sludge process or clean water. These are clearly different alternatives.

With regard to the comment that the claim limitation of “50 volume % or less” of the reactive gas includes no reactive gas, this is not the case in view of the subsequent step which clearly requires the formation of a gas dispersion.

With regard to the comment concerning “the same” in claim 12, line 6, such term no longer appears.

With regard to the comment concerning lack of antecedent basis for various terms in claim 20, no claim corresponding to claim 20 appears.

With regard to the objection concerning the exponent “2” in claim 12, this has been corrected in present claim 21.

Claims 12 to 20 are rejected under 35 U.S.C. 102(b) as clearly anticipated by JP 2003-126877.

Claims 12, 13, 17 and 18 are rejected under 35 U.S.C. 102(b) as clearly anticipated by JP 4-187298.

These rejections are respectfully traversed.

The presently claimed process relates to an improvement in the in-line atomizing process for sewage treatment and neither of the Japanese references discloses or is suggestive of the use of an “in-line atomizer”, so that these references are irrelevant to the present claims.

Moreover, the present claims contain several numerical limitations as essential for the intended improvement of the in-line atomizing process, including the pumping pressure and the diameter of the in-line atomized bubbles, on which the references are silent or indefinite.

Taking the diameter of the bubbles, for example, it is a requirement in claim 21 that the diameter be in the range from 1 nm to 30000 nm while claim 1 of JP ‘298 reference requires that the bubble diameter of air and oxygen be 100 μm (100000 nm) or smaller. Although the claimed range of 1-30000 nm may logically be included under the upper limit of 100000 nm, nobody informed of this teaching of the JP ‘298 reference would be motivated to employ the in-line atomizing process, only by which the diameter

of 1-30,000 nm could be obtained. In fact, no Examples are given in this reference in which the bubble diameter of 1-30000 nm was obtained.

While it is a requirement in claim 21 that the phenomenon of cavitation or ultrasonic waves is caused as a result of bubble atomization, such a phenomenon can take place at an atomizing pressure of only 1 to 55 kg/cm² according to the present invention, in contrast to the conventional bubble dispersing procedures undertaken in the JP reference, in which several thousands kg/cm² pressure is required.

For the foregoing reasons, it is apparent that the rejections on the Japanese references are untenable and should be withdrawn.

No further issues remaining, allowance of this application is respectfully requested.


If the Examiner has any comments or proposals for expediting prosecution, please contact undersigned at the telephone number below.

Respectfully submitted,

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